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Redescription of *Schistura myrmekia* (Fowler 1935) (Teleostei: Nemacheilidae)

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Abstract

Schistura myrmekia (Fowler 1935) was originally described from a single specimen collected from Keng Sok, southwestern Thailand. It was differentiated from a similar species, *S. desmotes* (Fowler 1934), by having four—rather than three—dark bands behind the dorsal fin, and the presence of a wart-like suborbital flap. Although *S. myrmekia* has since been placed in the synonymy of *S. desmotes,* it is distinguishable by the size and orientation of the suborbital flap, a much shorter maxillary barbel, and a more slender appearance. The holotype, the only known specimen of *S. myrmekia,* is redescribed and contrasted with other species of *Schistura* in southern Thailand. *Schistura myrmekia* is known only from the holotype, collected in an area that recently has been highly modified by human activities. Recent efforts to find the species have failed, and it is probably extinct.

Key words: Pisces, Cypriniformes, South Thailand, loach

Introduction

Fowler (1935) described *Nemacheilus myrmekia* from a single specimen 58 mm in total length (ANSP 63546) collected from Keng Sok in southwestern Thailand (Fig. 1A). *Nemacheilus myrmekia* was differentiated from *Nemacheilus desmotes* Fowler 1934 (Fig. 2), a species in which Fowler noted that the "color pattern greatly resembles" that of *N. myrmekia*, by having four rather than three dark bands behind the dorsal fin, and the presence of a "wart-like flap or spine" under the eye (the latter now usually referred to as a suborbital flap). Kottelat (1989) placed *Nemacheilus desmotes* in *Schistura*, and Kottelat (1990) placed *S. myrmekia* in the synonymy of *S. desmotes*. Kottelat (1990) also noted (citing Meyer de Schauensee 1946:4) that the type locality for *N. myrmekia* is about 20 km NNW Hua Hin in peninsular Thailand. This area is drained by several small rivers, the largest of which is the Mae Nam Phetchaburi flowing into the Gulf of Thailand near the border between Phetchaburi and Prachuap Khiri Khan provinces.

In examining geographic variation in populations identified by Kottelat (1990) as *S. desmotes*, it became clear that *S. myrmekia* is a valid species diagnosable from *S. desmotes*. The objective of this paper is to confirm the validity of *S. myrmekia* and redescribe the only known specimen.

Methods

Measurements and meristic counts, including counts of pores in the lateralis system, followed Kottelat (1990). Measurements were made point-to-point with dial calipers to the nearest 0.1 mm. Lengths are standard lengths unless otherwise indicated. Photographs were taken of preserved specimens using a Visionary Digital (Palmyra, Virginia) with Canon 40D and 5D cameras at the Florida Museum of Natural History. Specimens examined were from the Academy of Natural Sciences of Drexel University (ANSP), National Inland Fisheries Institute, Bangkok (NIFI), Museum of Comparative Zoology, Harvard University (MCZ), National Museum of Natural History, Washington, D.C. (USNM), and the Florida Museum of Natural History (UF).

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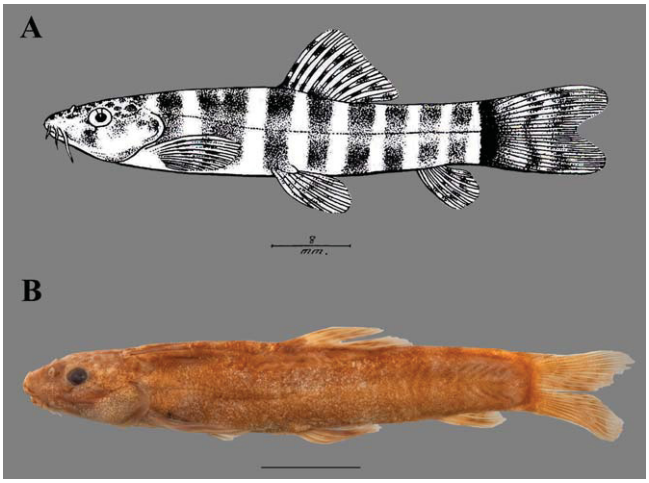

FIGURE 1. Holotype of *Schistura myrmekia* (ANSP 63546). (A) Original drawing by Fowler (1935) and (B) recent photograph (scale bar = 10 mm).

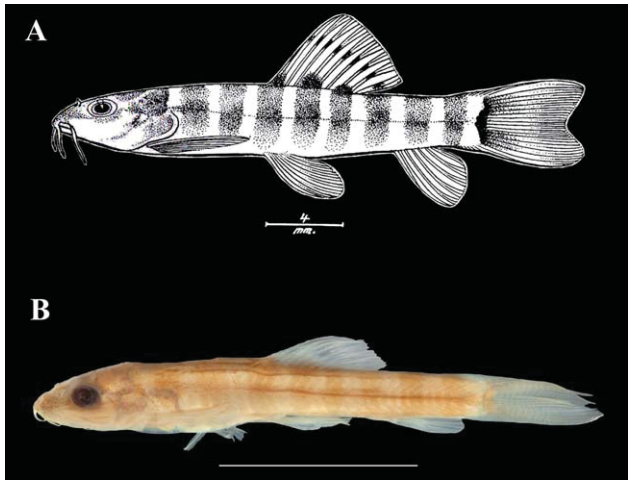

FIGURE 2. Holotype of *Schistura desmotes* (ANSP 60082). (A) Original drawing by Fowler (1934), and (B) recent photograph (scale bar = 10 mm).

***Schistura myrmekia* (Fowler 1935)**
(Fig. 1)

Nemacheilus myrmekia Fowler 1935
Schistura desmotes: Kottelat 1990

Redescription

Schistura myrmekia is known only from the holotype (a 46.5 mm-SL male), which is in fair condition, but with faded coloration and broken dorsal and caudal fins (Fig. 1). Some of the color pattern remains, including small dark spots on top of the head and eight dark bars along the side, more or less equal in width to the paler interspaces. As described by Fowler (1935) three of the bars precede the dorsal fin, one is under the fin, and four occur postdorsally. A dark bar is still visible at the base of the caudal fin and extends the depth of the peduncle, touching the dorsal and ventral margins of the peduncle. A large dark spot at the origin of the dorsal fin is not mentioned by Fowler or shown in his drawing (Fig. 1A), but is clearly visible in the holotype (Fig. 1B). Rows of small black spots are present on all fins.

The body is covered with small scales, except for the anterior one-fourth of the nape, on the breast, and on the midline of the belly posteriorly to about half the length of the depressed pectoral fin. Fowler's description of the entire nape as being unscaled or with only a few scattered scales is incorrect. The maxillary barbel extends horizontally to a vertical from the anterior margin of the eye, the inner rostral barbel extends almost to the corner of the mouth, and the outer rostral barbel reaches slightly past the corner of the mouth. A processus dentiformis is present in the upper jaw.

Fin-ray counts are: dorsal iv, 8½; anal iii, 5½; branched caudal 9 upper, 8 lower; pectoral 11; pelvic 8. Fowler gave the lateral-line scale count as 77; although the scales are extremely small and difficult to see, the count is closer to 95. The lateral line is nearly complete, ending on the caudal peduncle, with 86 pores. Cephalic pore counts are: supratemporal 3, supraorbital 4 + 8, infraorbital 10, and preoperculomandibular 9.

Morphometric data are given in Table 1. The eye is laterally directed, not reaching the dorsal profile; the pectoral fin reaches over half the distance from the pectoral-fin origin to the pelvic-fin origin; the dorsal-fin origin is anterior to the pelvic-fin origin; an axillary pelvic lobe is present; the suborbital flap is small, rounded posteriorly, dorsolaterally orientated, and not extending past the center of the eye.

TABLE 1. Morphometric data on *Schistura myrmekia* and *S. desmotes*.

	Schistura myrmekia holotype ANSP 63546	*Schistura desmotes* (n = 18; USNM 295777; UF 183066)	
		Mean	Range
Standard length (mm)	46.5	39.2	26.1–53.2
As %SL			
Predorsal length	47.7	49.9	46.8–52.1
Lateral head length	24.9	22.0	19.5–25.3
Snout length	9.4	8.8	7.7–9.9
Orbit diameter	3.8	4.3	3.8–5.6
Interorbital width	6.2	6.3	4.6–7.4
Prepelvic length	52.4	50.7	47.9–53.5
Preanal length	81.0	76.9	74.9–80.0
Body depth	17.5	14.8	13.2–17.6
Caudal-peduncle depth	11.8	10.5	9.54–11.6
Pectoral-fin length	21.1	20.5	16.3–23.5
Pelvic-fin length	18.8	18.0	15.5–19.5

FIGURE 3. (A) *Schistura desmotes* (UF 183066, 42.8 mm SL) from Ping River, Chiang Mai Province. (B) *Schistura sexcauda* (UF 181155, 43.1 mm SL), Kwai Noi River system, Kanchanaburi Province. Scale bars = 30 mm.

Discussion

Fowler (1934) described *S. desmotes* from two juveniles, a holotype 28 mm TL (now 22.1 mm SL) (Fig. 2) and a paratype 19.2 mm SL. A monochromatic drawing accompanied the description (Fig. 2A), in which he noted the absence of a suborbital flap. When Fowler (1935) described *S. myrmekia* one year later, he contrasted it with *S. desmotes*, noting minor differences in the color pattern and the presence in *S. myrmekia* of the "wart-like" suborbital flap.

Kottelat (1990) noted that the two specimens on which Fowler based his description of *S. desmotes* were too small to have developed a suborbital flap, and that more recent collections have shown a well-developed flap to be present in adult male *S. desmotes* (Fig. 3A). Although Kottelat was unable to examine the holotype of *S. myrmekia*, he concluded that it was an adult male *S. desmotes*, and he synonymized *S. myrmekia* with *S. desmotes*. However, *S. myrmekia* is distinguished from *S. desmotes* by the size and orientation of the suborbital flap and underlying groove, which end in front of the pupil of the eye, versus under the center of the eye in *S. desmotes* (Fig. 4); and the much shorter maxillary barbel, which extends horizontally to a vertical under the anterior margin of the eye in *S. myrmekia* but ends under or past the posterior margin of the eye in *S. desmotes*. The body depth, depth of the caudal peduncle, and preanal length in *S. myrmekia* are at the upper extremes of the values in *S. desmotes* (Table 1), giving *S. myrmekia* a more slender and uniform appearance than that of *S. desmotes* (Figs. 1, 3A).

Schistura desmotes is restricted to the Mae Nam Ping basin (Page *et al*., 2012), quite distant from the type locality of *S. myrmekia* (Fig. 5). The population of *Schistura sexcauda* (Fowler 1937) in the Mae Khlong basin in Kanchanaburi Province in western Thailand, misidentified by Kottelat (1990) as *S. desmotes*, is much closer geographically to the locality of *S. myrmekia*, and presumably influenced the decision to synonymize the names of these two species. However, *S. sexcauda* lacks a suborbital flap and, like *S. desmotes*, is not as slender as *S. myrmekia*.

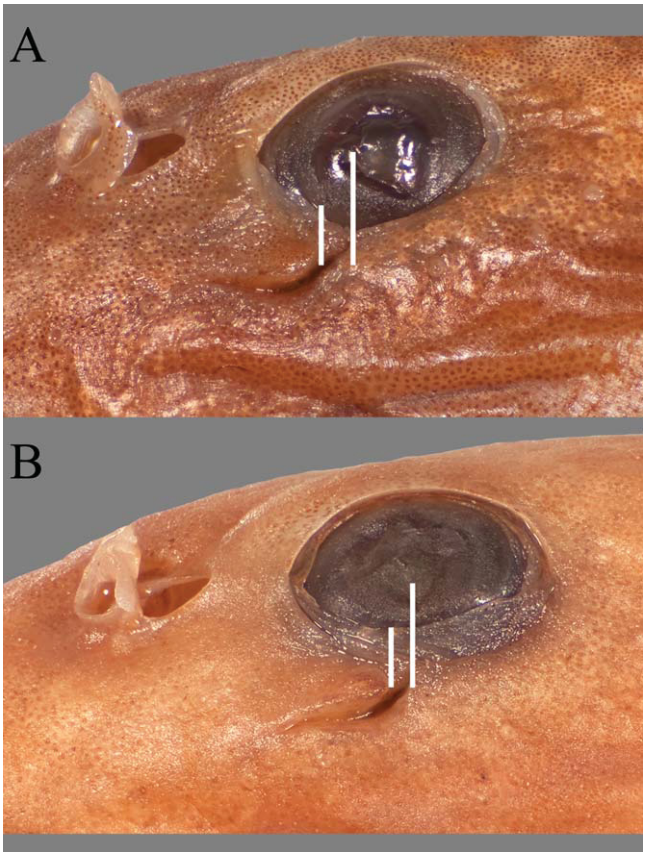

FIGURE 4. Suborbital flaps of (A) *Schistura myrmekia* holotype, ANSP 63546, 46.5 mm-SL male, and (B) *S. desmotes,* USNM 295777, 44.9 mm SL male. The flap and groove under the flap end anteriorly to the pupil of the eye in *S. myrmekia,* and near the center of the eye in *S. desmotes*.

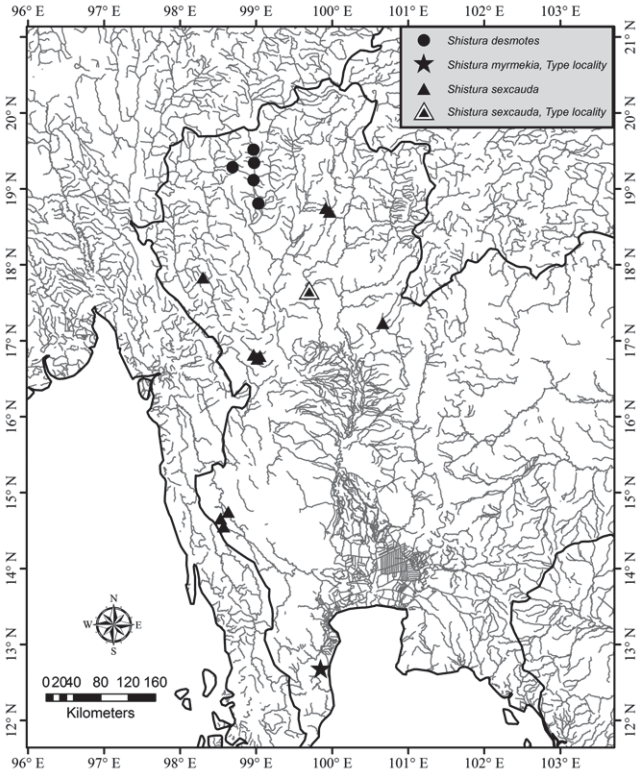

FIGURE 5. Known localities of *Schistura myrmekia, S. desmotes,* and *S. sexcauda*.

Schistura myrmekia is easily distinguished from other species of *Schistura* in South Thailand (Kottelat 1990, Bohlen & Ŝlechtová 2009). *Schistura robertsi* Kottelat 1990 has an incomplete lateral line and bold black marks on the lower lip. *Schistura geisleri* Kottelat 1990 has an arched body, 5–8 dark blotches along the side of the body instead of bars, and a hammer-shaped suborbital flap. *Schistura mahnerti* Kottelat 1990 has a more arched body and 15–17 dark bars on the side of the body with the anterior bars divided and the posterior bars widely separated. *Schistura udomritthiruji* Bohlen & Ŝlechtová has an incomplete lateral line (ending at the anal fin), and a series of predorsal and postdorsal bars of varying sizes, unlike the uniform bars found on *S. myrmekia.*

An attempt was made to collect *S. myrmekia* in April, 2011, in the general area of the type locality near Keng Sok/Hua Hin in Prachuap Khiri Khan Province, Thailand. Unfortunately, the area has been severely impacted by development, including the construction of a golf course and the Kaeng Krachan Dam on Mae Nam Petchaburi. No suitable habitat was found in the area, and it seems likely that *S. myrmekia* has been extirpated from its type locality and is probably extinct.

Material Examined (number of specimens followed by SL in parentheses unless otherwise noted)

Schistura desmotes: THAILAND: PING RIVER BASIN: CHIANG MAI PROV: ANSP 60082 (22.1 mm), holotype, Chiang Mai, 3 Jan. 1933; ANSP 60083 (19.6 mm), paratype, same data as ANSP 60082; ANSP 60084 (17.9 mm), same data as ANSP 60082; ANSP 56830 (21.6 mm), Me Nam Ping, 450 mi. N Bangkok, 75 mi. E Karenni, Burma, 2 Jan. 1933; ANSP 56831 (19.3 mm) same data as ANSP 56830; ANSP 60081 (16.1 mm), same data as ANSP 56830; USNM 295777 (8; 40.2–44.9 mm), Me Nam Ping near Chiang Dao (19.343°N, 98.975°E), 26 Apr. 1973. UF 183066 (10 of 16; 26.1–53.2 mm), Mae Nam Ping, on hwy 7 at km 62 (19.286°N, 98.690°E), 25 Jan. 2012.

Schistura mahnerti: THAILAND: SALWEEN RIVER BASIN: MAE HONG SON PROV.: NIFI 855 (44.4 mm), paratype, Mae Sahm Leap, Amphoe Mae Sariang, 22 Jan. 1981; NIFI 864 (15; 17.5–56.4 mm), paratypes; Mae Sariang, Mae Sariang District, Amphoe Mae Sariang, 29 May 1978. TAK PROV.: NIFI 876 (8; 24.8–28.0 mm), Moei River, Ban Huai Pong, Amphoe Tha Song Yang, 10 Jun. 1981; USNM 288462 (6; 21.5–55.6 mm), paratypes, mountain stream, 5 km W Mae Sariang, 29 Apr. 1973. MAE KHLONG BASIN: KANCHANABURI PROV.: NIFI 3056 (10 of 14; 32.8–54.8 mm), Thung Yai Naresuan Wildlife Conservation Area, 4 Apr. 1996. NIFI 3082 (48; 32.7–65.5), near Mae Khamin Waterfall, 4–5 Jan. 1998; UF 178531 (6; 48.5–58.7 mm), Khayeng River, near Tong Pha Phum (14º33’22”N, 98º34’20”E), 25 May 2010. GULF OF THAILAND BASIN: PRACHUAP KHIRI KHAN PROV.: UF 178530 (4; 53.1–74.0 mm), Bang Sapan, (11º14’24”N, 99º21’27”E), 25 May 2010.

Schistura myrmekia: THAILAND: PRACHAUP KHIRI KHAN PROV: ANSP 63546 (46.5 mm), holotype, Keng Sok (Hua Hin), Prachuap Khiri Khan, 3 Feb. 1934.

Schistura robertsi: THAILAND: PHANGNA PROV.: PHANGNGA RIVER BASIN: UF 182835 (2; 27.6–29.7 mm), Phuphi River, Thai Mueang, Thailand (8°34’17.1’’N, 98°25’4.2’’E), 4 Jan. 2012. MCZ 47273 (13; 21.4–38.3 mm), paratypes, Nong Hong River near Phangnga, 29 Jun. 1970. PHUKET PROV.: MCZ 49164 (11 of 21; 23.0–32.9 mm), paratypes, Phuket Island, Ton Sai Waterfall, about 4 km E Thalang, 27 Jun. 1970.

Schistura sexcauda: THAILAND: PHRAE PROV.: MAE NAM YOM BASIN: ANSP 68007 (93.3 mm), holotype, Me Poon (small tributary of Me Yom; properly Me Phun or Me Bhun), 1936. ANSP 88046, same locality as ANSP 68007 (10; 21.9–40.0 mm), 1936. MAE NAM PING BASIN: TAK PROV.: NIFI 878 (1; 61.3 mm), Huei Ban Na, Bhumbipol Dam; 20 Nov. 1973; NIFI 2185 (2; 33.3–35.3 mm), Nam Tok Lansang, (16º46'N, 99º01'E), Lansang National Park, Amphoe Muang, Sep. 1978. MAE KHLONG BASIN: KANCHANABURI PROV.: UF 176413 (3; 26.5–34.0 mm), Kwai Noi River, Khayeng River, hwy 3272 bridge (14º39’35”N, 98º32’01”E), 3 Jan. 2010; UF 182095 (30; 29.3–57.2 mm), Kwai Noi River, Khayeng River, hwy 3272 bridge, (14º33’22”N, 98º34’20”E), 27 Oct. 2010; UF 181084 (16; 30.1–50.5 mm) same locality as UF 182095, 25 Apr. 2011; UF 181155 (7; 32.9–55.0 mm), Kwai Noi River system, Pakkok River system, Ban Huay Pousa (14º38'0"N, 98º48'0"E), 20 Apr. 2011; uncatalogued, Burapha Univ. (10; 40.1–58.9 mm), same locality as UF 182095, 6 Jun. 2010; uncatalogued, Burapha Univ. (10; 45.5–56.2 mm); same locality as UF 182095, 30 Dec. 2010; USNM 295767 (13; 21.0–27.0 mm), Kwai Noi River between Kanchanaburi and Sai Yok, 13–14 Apr. 1973.

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